Aug. 21, 1928. 1,681,342

W. A. HICKMAN

BOAT

Filed Jan. 10, 1923 2 Sheets-Sheet 1

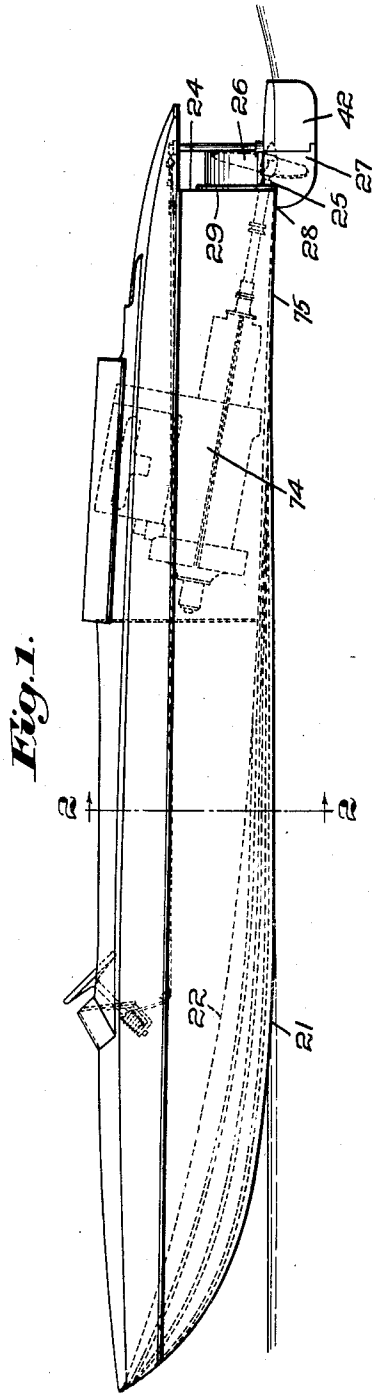


Fig. 1.

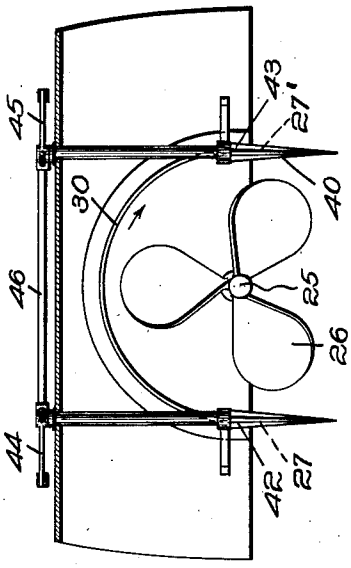


Fig. 3.

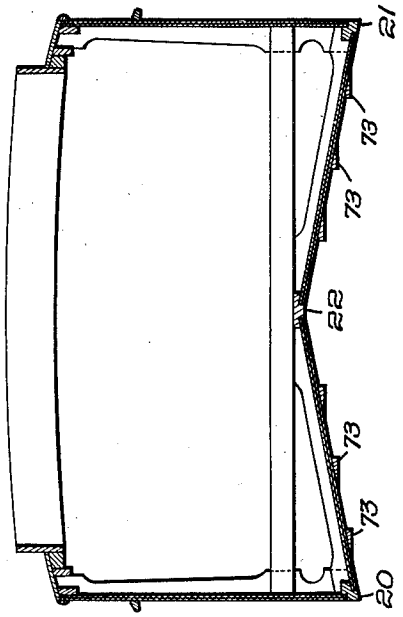


Fig. 2.

Inventor:
William A. Hickman,
by Emery, Booth, Janney & Varney,
Attys

Aug. 21, 1928. 1,681,342

W. A. HICKMAN

BOAT

Filed Jan. 10, 1923 2 Sheets-Sheet 2

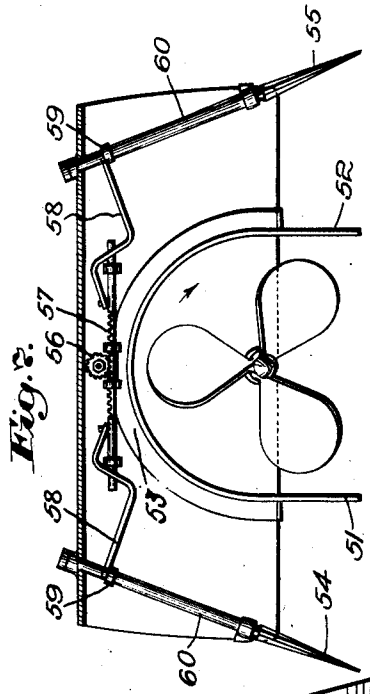


Fig. 2.

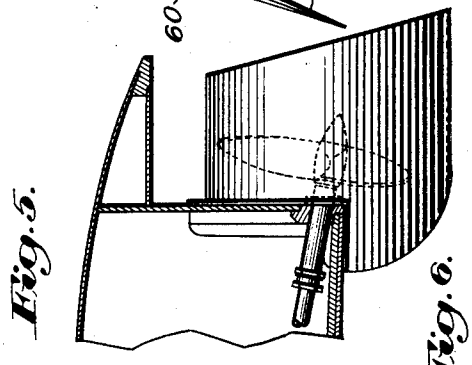


Fig. 5.

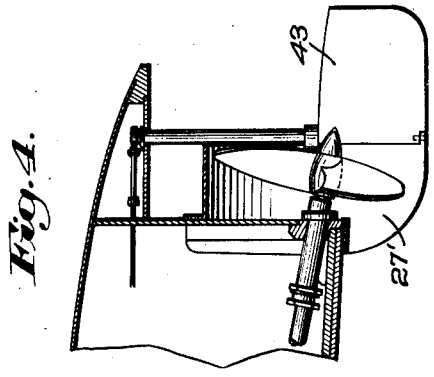


Fig. 4.

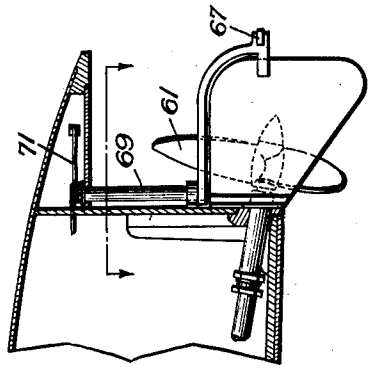


Fig. 9.

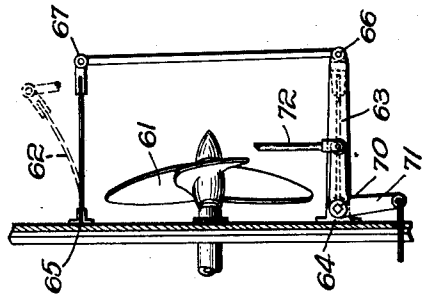


Fig. 8.

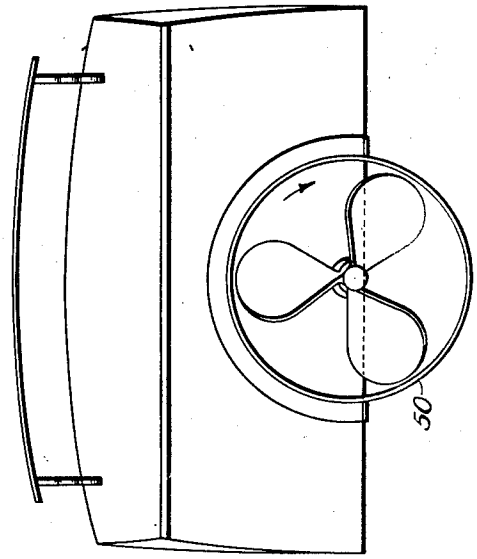


Fig. 6.

Inventor:
William A. Hickman
by Emery, Booth, Janney & Varney.
Attys.

Patented Aug. 21, 1928. 1,681,342

UNITED STATES PATENT OFFICE.

WILLIAM ALBERT HICKMAN, OF WEST MYSTIC, CONNECTICUT.

BOAT.

Application filed January 10, 1923. Serial No. 611,886.

This invention pertains to improvements in boats and boat propulsion systems. It is among the objects of the invention to provide a boat of superior efficiency.

In the drawings, which show a preferred form of one embodiment of my invention:

Figure 1 is a side elevation of a boat;

Fig. 2 is a section on the line 2—2 of Fig. 1;

Fig. 3 is a stern elevation of the boat, being partly in section;

Fig. 4 is a vertical longitudinal section through the stern of a boat showing on an enlarged scale the propulsion and steering system shown in Fig. 1, and being partly in elevation;

Fig. 5 is a view similar to Fig. 4, but showing a modification of the propulsion system;

Fig. 6 is a rear elevation of a boat provided with the modified propulsion system shown in Fig. 5;

Fig. 7 is a rear elevation provided with another modification of the propulsion system and with a modified form of steering control;

Fig. 8 is a partial section showing in plan a further modification of the propulsion and steering systems combined; and

Fig. 9 is a central longitudinal section, partly in elevation, of the modified system shown in Fig. 8.

The present application is subordinate to my co-pending application Serial No. 611,885, filed herewith, and shows modifications of the boat and boat propulsion described and claimed in such co-pending application.

Referring to the drawings, I have shown a boat including a hull of the inverted V-bottom type having chines 20, 21 located considerably below the keel 22 to provide a bottom of inverted V section, of which the angle gradually becomes flatter as the stern is approached, being generally of the type illustrated in my application Serial No. 604,596, filed December 2nd, 1922.

Projecting through the stern transom 24 of the boat, I have shown a propeller shaft 25 carrying a single surface propeller 26 which may be, as illustrated, in the central longitudinal plane of the boat.

In that embodiment of my invention shown in Figs. 1, 3 and 4, I have provided on each side of the propeller 26 fixed plates 27, 27′ rigidly connected at 28, 29 to the stern of the boat and stiffened and connected by an integral arched piece of sheet metal 30 extending above the propeller, thereby to prevent splash as well as to stiffen the plates 27, 27′. The function of the plates 27, 27′ is to contribute to keeping the boat on a straight course by counteracting the tendency of the single surface propeller 26 to paddle the stern of the boat toward that side in which the propeller blades initially contact with the water when revolving. Thus, assuming the propeller to be revolving in clockwise direction, as viewed in Fig. 3, the pressure of the water on the inside 40 of the plate 27′ will be reduced, while the pressure of the water on the inside 41 of the plate 27 will be increased, thereby each plate, by reason of the unbalanced pressures of the water on opposite sides thereof, urging the stern of the boat to port and counteracting the tendency of the propeller blades 26 to urge the stern of the boat to starboard.

In the preferred form of my invention shown in Fig. 1, the rudders 42, 43 contribute to this counteracting tendency, being located somewhat rearwardly of the propeller and catching the water delivered rearwardly and outwardly therefrom. The rudders 42, 43 may be connected for conjoint action by suitable bell cranks 44, 45 and a connecting rod 46 generally as shown in my co-pending application Serial No. 611,885, filed herewith.

In the modified form of my invention shown in Fig. 5, I have shown the counteracting plates combined in a cylinder 50 which may, as illustrated, extend completely around the propeller. Where the cylinder or partial cylinder extending beneath the propeller is used, the lower portion thereof catches the water deflected downwardly and laterally by the propeller, thus serving exceedingly efficiently to prevent lateral movement of the stern of the boat actuated by the paddling action of the single surface propeller. The upper surface of the cylinder serves as a splash guard and to steady and stiffen the remainder of the counteracting plate surfaces.

Any preferred form of rudder mechanism may be used to steer the boat where that embodiment of my invention shown in Figs. 5 and 6 is utilized.

In Fig. 7, I have shown a further modification wherein the counteracting plates 51 and 52 are entirely independent of the rudder mechanism, being preferably connected together and stiffened by the overlying arched unitary plate portion 53. The rudders 54 and 55 are herein shown as located at each

side of the boat and flaring downwardly and outwardly so that they are in planes which intersect above the hull of the boat. Suitable connections for moving them in unison may be provided typified by the pinion 56 and connected with the steering wheel of the boat, and actuating rack 57 connected through suitable rods 58, 58 to arms 59, 59 connected to the pivots or stocks 60, 60 of the rudders 54 and 55.

In Figs. 8 and 9, I have shown a modification of the counteracting surfaces, so that they are located immediately at each side of the propeller 61, taking the form of flexible plates 62 and 63 having their front ends 64 and 65 secured to the stern transom of the boat. The plates serve also as rudders, being adapted to be bent by connections 66 and 67 fixed to the rear ends and connected through steering posts 69 and 70 to appropriate rudder-actuating mechanism typified by the bell crank 71 and connecting rod 72 for conjoint movement by the wheel or tiller of the boat.

In Fig. 2, I have shown steps 73 extending longitudinally of the boat and adapted to break any tendency of the water to adhere to the inverted V-bottom thereof when at speed. The action of a surface propeller tends to raise the stern of the boat and throw it on the forward sections. The steps herein shown tend to raise the bow higher than would otherwise be normal and compensate for the action of the surface propeller. It will be noted from Fig. 2 that the steps, presenting relatively abrupt angles to the keel of the boat, have surfaces presented relatively flat to the water and as the V of the bottom is greatest at the forward portion of the boat a lifting effect forward is provided for.

In the drawings of the present application, I have shown the engine 74 located well aft and cooperating with a portion of the bottom of the boat adjacent the stern having an increasing angle of incidence aft of the point 75 as shown in Fig. 1.

While I have shown and described one preferred embodiment of my invention, it is understood that I have done so for purposes of description and not for purposes of limitation and that, while I have shown and described a preferred combination of various improved features in a single boat and while such features are particularly useful in combination with each other, they are nevertheless of use independently of each other and that major changes involving omission, alteration, substitution and reversal of parts and even changes in the mode of operation may be made without departing from the scope of my invention, which is best defined in the following claims.

Claims:

1. A boat having a hull, a single propeller having a hub normally emersed when the boat is under way and a fixed non-steering plate having a portion immersed in the water laterally of said propeller at a clearance therefrom to provide a body of water in which the propeller blades freely turn and which reacts on said surface.

2. A boat having a hull, a single propeller having a hub normally emersed when the boat is under way and a fixed non-steering plate having a portion immersed in the water laterally of said propeller on that side where the blades enter the water at a clearance therefrom to provide a body of water in which the propeller blades freely turn and which reacts on said surface.

3. A boat having a hull, a single propeller having a hub normally emersed when the boat is under way and a fixed non-steering plate having a portion immersed in the water laterally of said propeller at that side where the blades leave the water at a clearance therefrom to provide a body of water in which the propeller blades freely turn and which reacts on said surface.

4. A boat having a hull, a single propeller having a hub normally emersed when the boat is under way and fixed non-steering surfaces having immersed portions laterally adjacent the propeller and defining between them a body of water in which the blades of the propeller freely operate and cause a reaction of the moving water against said portion.

5. A boat having a hull, a single propeller having a hub normally emersed when the boat is under way and fixed non-steering surfaces having immersed portions laterally adjacent the propeller and defining between them a body of water in which the blades of the propeller freely operate and cause a reaction of the moving water against said portion, said surfaces connected together above the propeller to stiffen them and provide a splash guard.

6. A boat having a hull, a single propeller having a hub normally emersed when the boat is under way and fixed non-steering surfaces having immersed portions laterally adjacent the propeller and defining between them a body of water substantially unobstructed beneath the propeller in which the blades of the propeller freely operate and cause a reaction of the moving water against said portion.

7. A boat having a hull the bottom of which presents inverted V sections broadening aft and adapted to deliver a sheet of water to a propeller from beneath said bottom, a single propeller having a hub normally emersed when the boat is under way and plate means subject to the wash of the propeller for opposing lateral movement of the stern by said propeller and rudder means independent of said plate means.

8. A boat having a hull the bottom of which

presents inverted V sections broadening aft, a single propeller having a hub normally emersed when the boat is under way and a fixed non-steering plate having a portion immersed in the water laterally of said propeller at a clearance therefrom to provide a body of water in which the propeller blades freely turn and which reacts on said surface.

9. A boat having a hull the bottom of which presents inverted V sections broadening aft, a single propeller having a hub normally emersed when the boat is under way and fixed non-steering surfaces having immersed portions laterally adjacent the propeller and defining between them a body of water in which the blades of the propeller freely operate and cause a reaction of the moving water against said portion.

10. A boat comprising, in combination, a hull, a single surface propeller, counteracting plate means opposing lateral movement of the stern of the boat by said single surface propeller, and associated rudder means angled relative to the vertical and located generally in planes crossing above the hull of said boat, said rudder means acting to depress that side of the boat on the inside of a turn and to elevate that side of the boat on the outside of a turn.

11. A high speed motor boat having a bottom presenting a concavity of inverted V section gradually broadening from a point forward to a point aft in substantially smooth longitudinal curves to provide generally diagonally presented surfaces and longitudinal water breaks along the sides of the concavity opposing the tendency of the water to cling to the sides of the concavity to fill the same.

12. A high speed motor boat having a bottom presenting a concavity of inverted V section gradually broadening from a point forward to a point aft in substantially smooth longitudinal curves to provide generally diagonally presented surfaces and longitudinal steps along the sides of the concavity having downwardly presented shoulders to break the water from the sides of the concavity.

13. A boat having surface propeller propulsion means located aft, a hull having an inverted V bottom of greater depth forward presenting diagonal surfaces and longitudinal steps on the V surfaces of said bottom breaking the continuity of said surfaces.

14. A boat having surface propeller propulsion means located aft, a hull having an inverted V bottom of greater depth forward presenting diagonal surfaces and longitudinal steps on the V surfaces of said bottom breaking the continuity of said surfaces and presenting surfaces relatively flat to the water whereby to lift the bow of the boat to compensate the tendency of the surface propeller to throw the boat on its forward sections.

In testimony whereof, I have signed my name to this specification.

WILLIAM ALBERT HICKMAN.